

Neptune modular rockets for breakthrough low-cost space access, Phase I

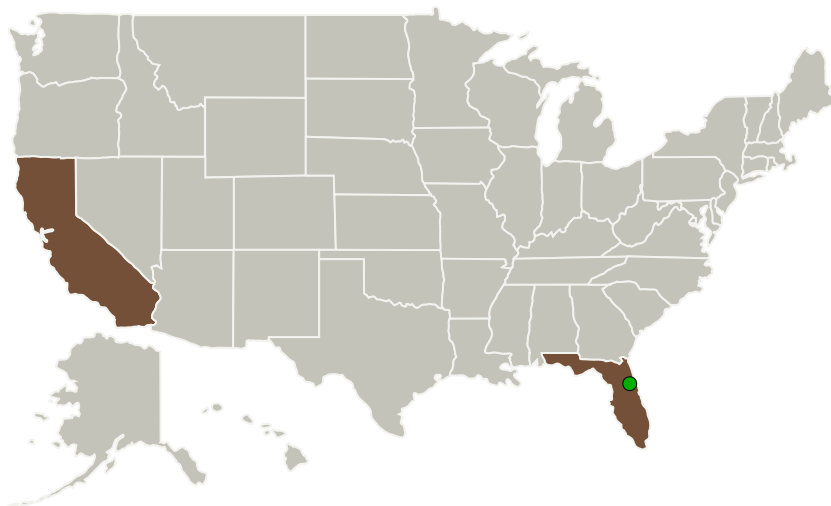
Completed Technology Project (2012 - 2012)



Project Introduction

Interorbital Systems is developing a new generation of modular, low-cost, rapid-response space launch vehicles. Interorbital modular rockets core element is the Common Propulsion Module (CPM). The CPM is a liquid rocket engine, propellant and pressurization section and aerodynamic faring integrated into a self-contained module. The liquid rocket engine is ablatively cooled and operates in a blowdown pressurization mode using low-cost, storable hypergolic propellants. Interorbital has successfully static test fired a 4,500lb thrust CPM main engine demonstrating combustion stability and throttling capability. Interorbital modular rocket systems were developed under the Minimum Cost Design paradigm and will deliver breakthrough cost reductions in space access. Cost reductions in propulsion are achieved by elimination of complex pressurization, ignition components, cooling, and propellant infrastructure normally associated with typical liquid rocket technology. Further cost reductions in the space launch value chain are attained by utilizing commercially available components and developing simplified manufacturing and operations minimizing need for capital intensive infrastructure and highly skilled labor. These unprecedented reductions in space access costs do not sacrifice performance or reliability. CPM technology is scalable and readily configurable to suit numerous suborbital or orbital mission profiles. CPMs may be arrayed as launch vehicle first stage boosters or as unitary elements for sustainer and upper stages. Interorbital modular rockets are uniquely suited to support the emerging nanosatellite market while offering an American alternative for existing public and private sector space access requirements.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Interorbital Systems	Lead Organization	Industry Women-Owned Small Business (WOSB)	Mojave, California
● Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations

California	Florida
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Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138347>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Interorbital Systems

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

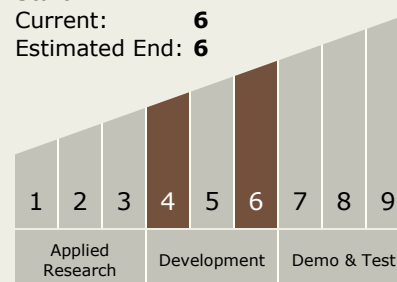
Carlos Torrez

Principal Investigator:

Roderick Milliron

Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System